Miller
The Power of Blue.

OM-1085 052 563E
January 1996

Processes

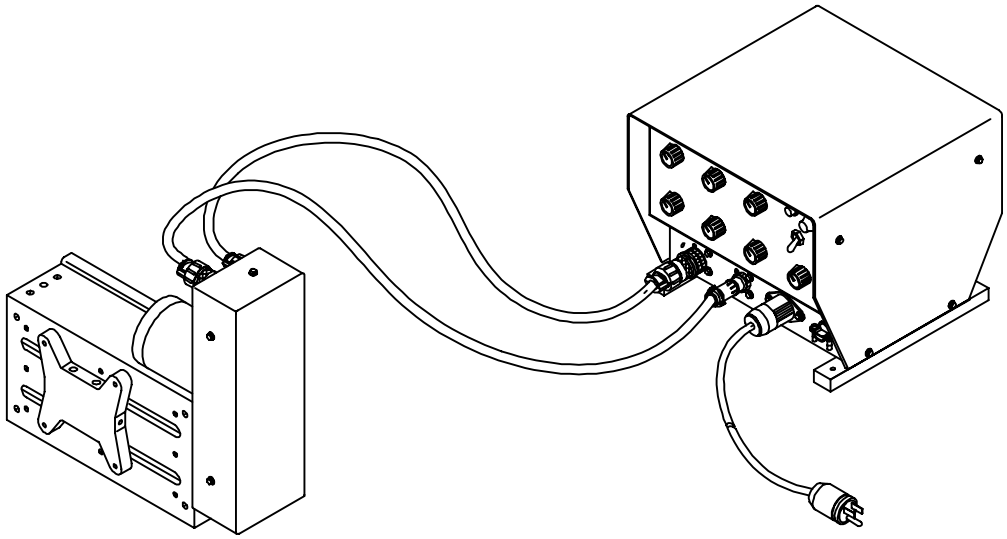
Automatic Welding

Description

1 Phase AC

Automatic Welding System

Weld Oscillator



OWNER'S MANUAL

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. To locate your nearest distributor call 1-800-4-A-Miller.

Miller®
The Power of Blue.

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

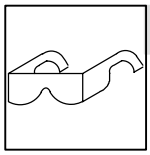
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

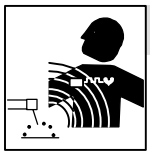
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

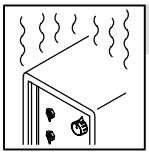
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

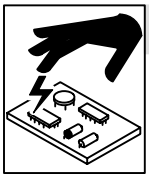
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

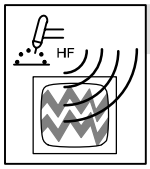
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION

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1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

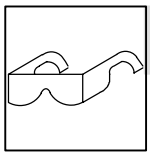
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

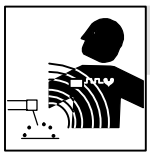
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

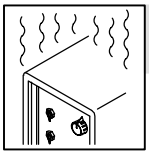
1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

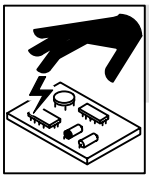
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

DES ORGANES MOBILES peuvent provoquer des blessures.

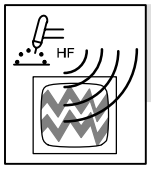
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

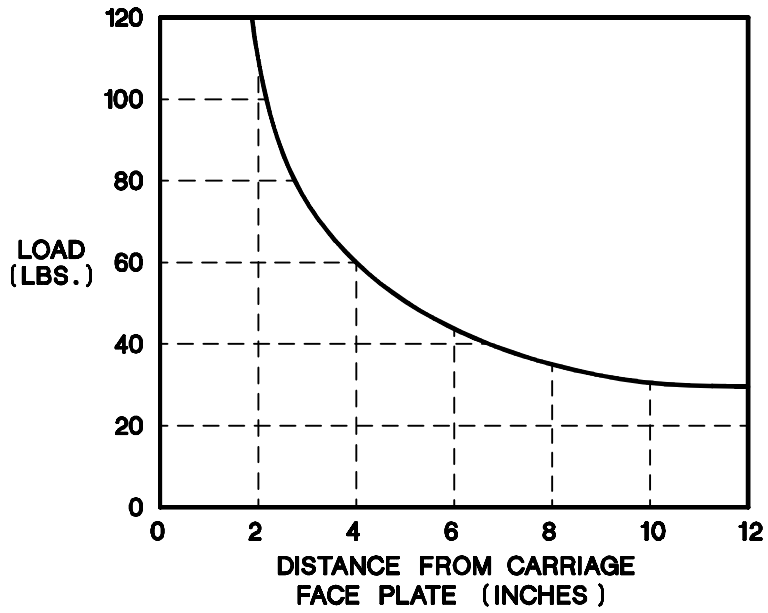
Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci−dessus.

SECTION 2 – INSTALLATION

2-1. Specifications

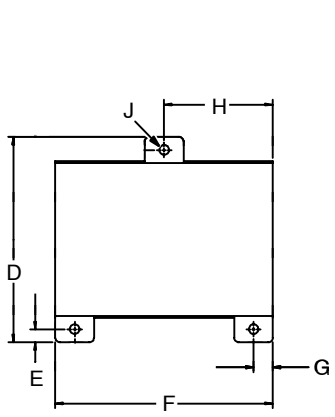
Input Power	Speed	Dwell	Total Slide Travel	Width	Center Adjustment	Weight		
						Item	Net	Ship
115 Volts AC ±10% Single Phase	16 To 130 IPM	0.1 To 2 Seconds	5 in (127 mm)	1/8 To 1-1/2 in (3 To 38 mm)	±1-1/2 in (38 mm)	Control	27 lb (12 kg)	32 lb (14.5 kg)
						Slide	28 lb (12.7 kg)	33 lb (15 kg)
						Cables	5 lb (2.3 kg)	5-1/2 lb (2.5 kg)

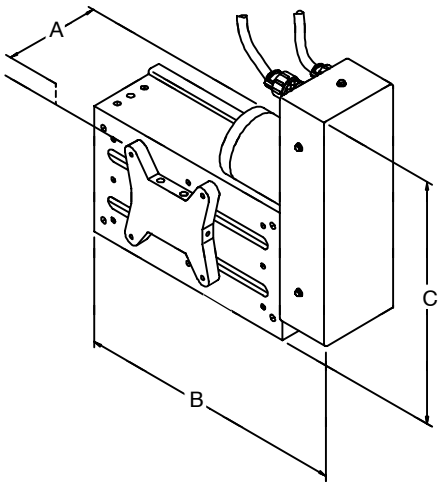
2-2. Load Data



SA-052 831-A

2-3. Oscillating Slide Dimensions



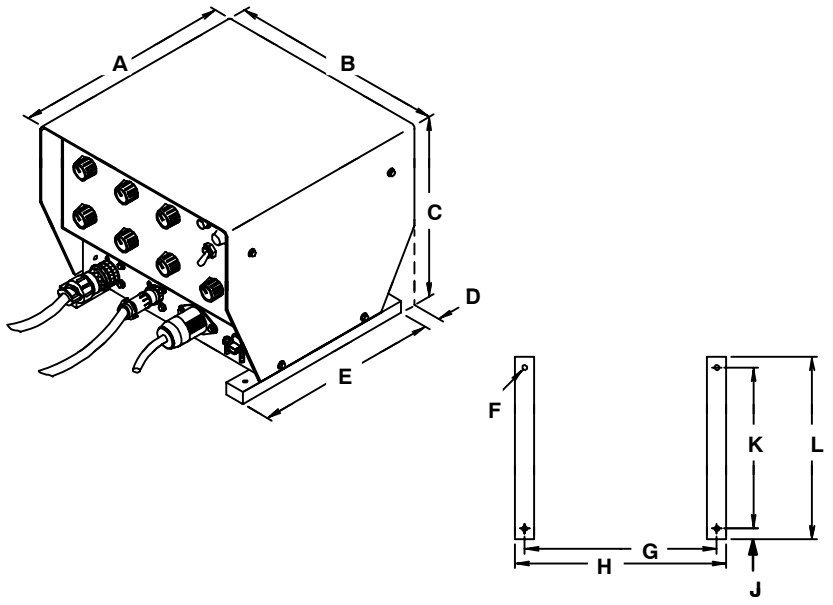


ST-091 229-A

Dimensions	
A	5 in (127 mm)
B	14 in (356 mm)
C*	14-3/8 in (365 mm)
D	9-3/8 in (238 mm)
E	5/8 in (16 mm)
F	11-3/16 in (284 mm)
G	1 in (25 mm)
H	5-19/32 in (142 mm)
J	17/32 in (13 mm) Dia

*To Bottom Of Mounting Feet.

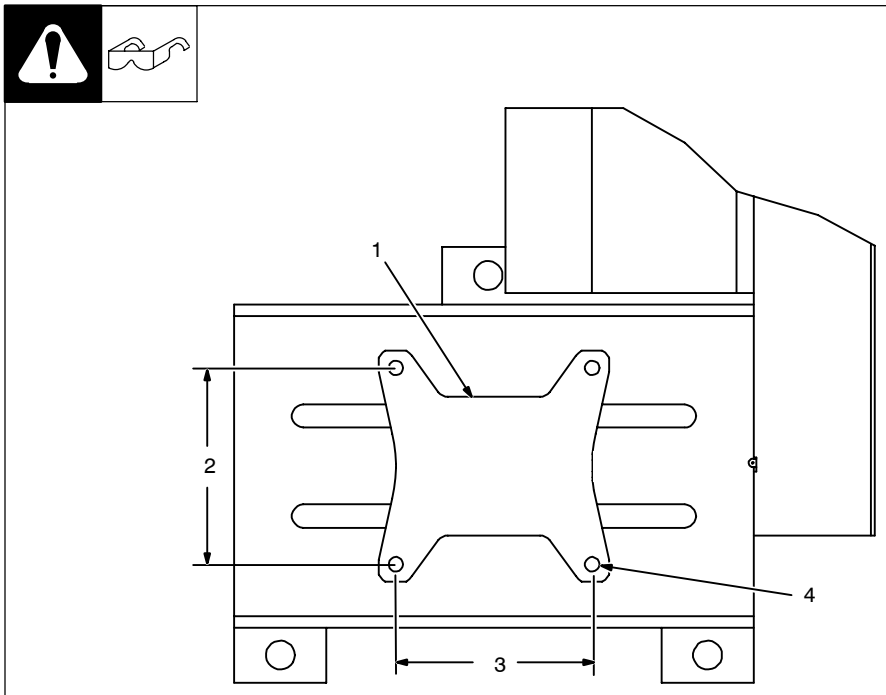
2-4. Oscillator Control Dimensions



Ref. ST-052 314-A

	Dimensions
A	11-1/4 in (285 mm)
B	11-1/4 in (285 mm)
C	9-1/2 in (241 mm)
D	3/4 in (19 mm)
E	9-1/2 in (241 mm)
F	9/32 in (7 mm) Dia
G	10 in (254 mm)
H	11 in (279 mm)
J	5/8 in (16 mm)
K	8-1/4 in (210 mm)
L	9-1/2 in (241 mm)

2-5. Installing Gun Onto Mounting Plate



1 Gun Mounting Plate
2 4-1/4 in. (108 mm)
3 4-1/4 in. (108 mm)
4 3/8–16 UNC Tapped Holes

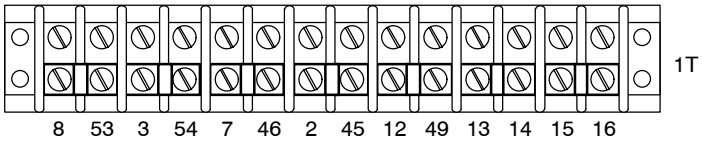
Do not use screws longer than 1/2 in. (13 mm) to secure gun to plate.

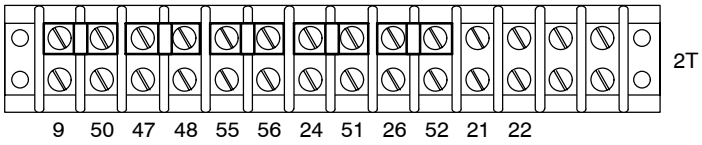
Tools Needed:

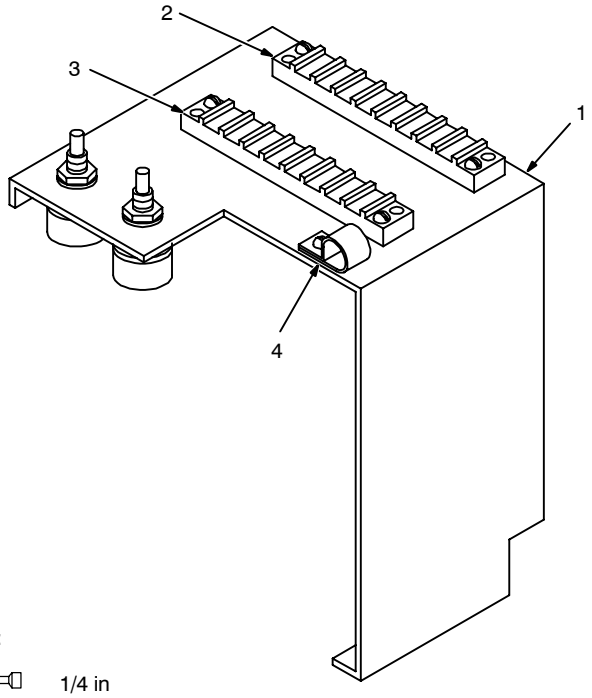
9/16

Ref. ST-154 578

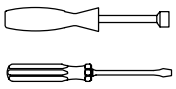
2-6. Installation Of Customer-Supplied Remote Controls







Tools Needed:



Remove oscillator control wrapper.

Loosen strain relief on lower right side of front panel.

Use matching type controls for remote control functions (see Parts List).

1 Mounting Bracket
2 Terminal Strip 1T
3 Terminal Strip 2T
4 Plastic Clamp

Route leads from remote controls through strain relief on front panel, through plastic clamp on bracket, to terminal strips.

When installation is complete, tighten strain relief and reinstall wrapper.

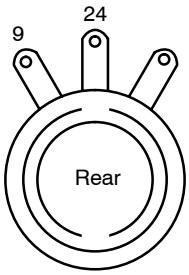
ST-052 705-A

A. Remote Start/Stop Switch

NOTE ☞ *For the remote start/stop switch to work, the Mode switch must be in the RUN position.*

Connect leads from normally-closed switch to terminals 2T21 and 2T22.

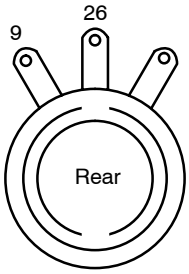
B. Remote Dwell On Left Control



Remove jumper link between 2T24 and 2T51.

Connect leads from remote control to 2T9 and 2T24.

C. Remote Dwell On Right Control

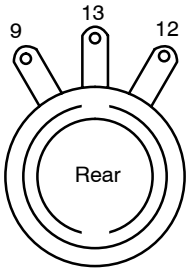


Remove jumper link between 2T26 and 2T52.

Connect leads from remote control to 2T9 and 2T26.

D. Remote Travel Width Control

NOTE ☞ *If multiple Travel Width remote controls are desired, they must be switched using relays with gold alloy cross bar type contacts or equivalent.*

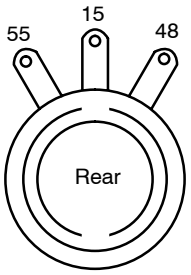


Remove jumper links between 1T13 and 1T14, and 1T12 and 1T49.

Connect leads from remote control to 1T12, 1T13, and 2T9.

E. Remote Center Position Control

NOTE ☞ *If multiple Center Position remote controls are desired, they must be switched using relays with gold alloy cross bar type contacts or equivalent.*

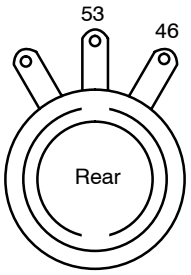


Remove jumper links between 1T15 and 1T16, and 2T47 and 2T48.

Connect leads from remote control to 1T15, 2T48, and 2T55.

F. Remote Speed To Left Control

NOTE ☞ *If multiple remote speed controls (more than one of either left or right) are desired, an optional multi-pass circuit board must be installed.*

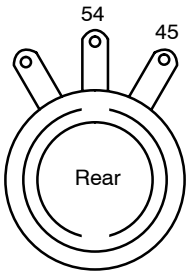


Remove jumper link between 1T8 and 1T53.

Connect leads from remote control to 1T46 and 1T53.

G. Remote Speed To Right Control

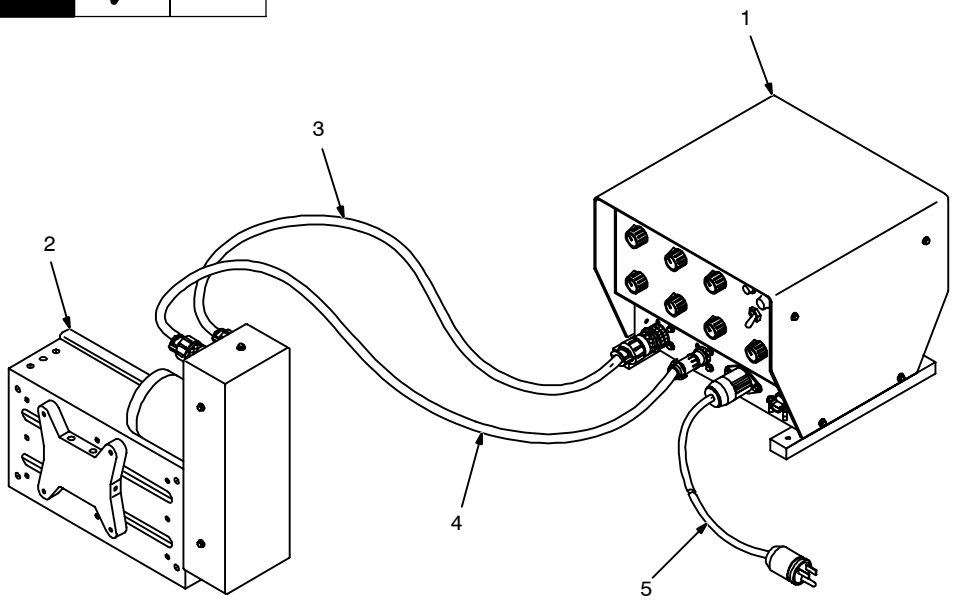
NOTE ☞ *If multiple remote speed controls (more than one of either left or right) are desired, an optional multi-pass circuit board must be installed.*



Remove jumper link between 1T3 and 1T54.

Connect leads from remote control to 1T45 and 1T54.

2-7. Interconnecting, Oscillator Control, and Power Cord Connections



1 Oscillator Control

2 Oscillating Slider Assembly

3 Interconnecting Cord

Connect cord to matching receptacles on control and slider.

4 Oscillator Control Cord

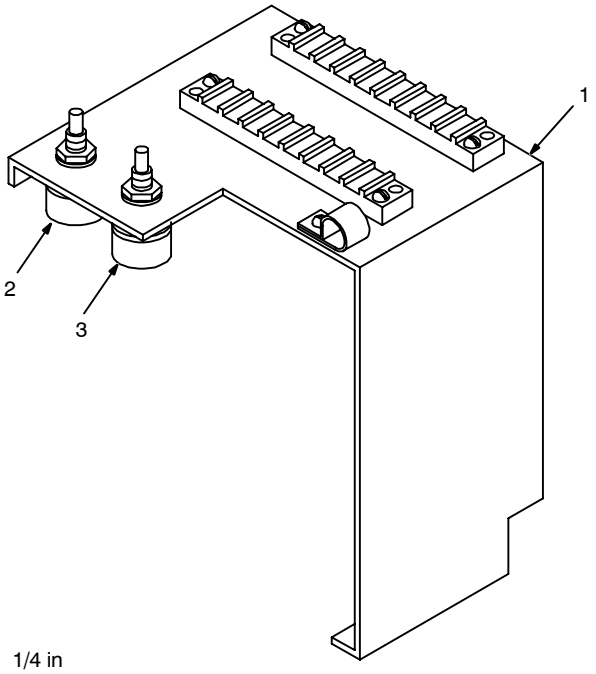
Connect cord to matching receptacles on control and slider.

5 115 Volts AC Power Cord

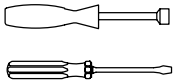
Connect twistlock plug to receptacle on control. Connect plug on remaining end of cord to matching grounded and protected (time delay fuses or circuit breakers) 115 volts ac receptacle.

ST-052 310-A

2-8. Travel Width And Center Position Internal Adjustment



Tools Needed:



1/4 in

☞ *The unit is shipped from the factory with the travel width set for 1/8 to 1-1/2 in (3 to 38 mm). Adjustments can be made for total slide travel of 5 in (127 mm).*

Remove oscillator control wrapper.

1 Mounting Bracket

2 Potentiometer R13 For Travel Width

3 Dual Potentiometer R9 And R11 For Center Position

☞ *When travel width is increased, the center position must be decreased or slide internal components may hit the ends of the housing.*

Rotate R13 in a counterclockwise direction to increase travel width. Decrease center position by rotating R9/R11 clockwise.

Reinstall unit wrapper.

Apply power and check adjustments. Repeat procedure until adjustment is satisfactory.

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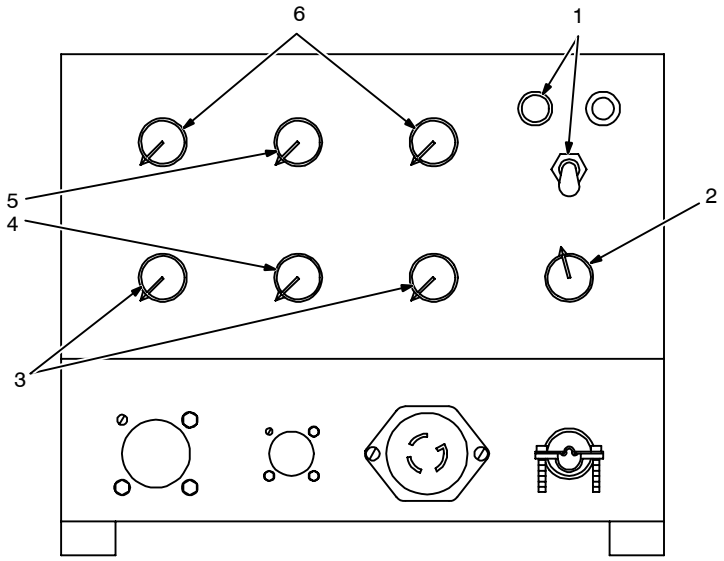
SECTION 3 – OPERATION

3-1. Controls



ST-052 315-A

1 Power Switch And Pilot Light

Use Power switch to turn unit and pilot light On and Off.

2 Mode Switch

Set-Up position allows adjustment of the Center Position control to position the welding gun over the weld joint before the welding operation.

▲ **LEAVING UNIT IDLE IN STAND BY can cause equipment damage. Shut down unit when not being used in Stand By mode.**

Stand By position automatically centers and locks the welding gun in place. The Center Position control is the only functional control in this mode. The Center Position control will cause the gun to move in one direction only without return capability.

Run position is used during welding. All front panel controls are adjustable in Run mode.

3 Dwell Controls

Dwell On Left and Dwell On Right controls set time that welding gun remains at either end of its set travel width before reversing direction. Control calibration is in percent and provides 0.1 to 2 seconds of adjustment.

4 Travel Width Control

This control sets width of welding gun oscillation. Control calibration is in percent and factory set width is 1/8 to 1-1/2 in (3 to 38 mm). Internal adjustment is provided according to Section 2-8.

5 Center Position Control

☞ *Center Position control is fully operational in Set-Up and Run modes.*

This control adjusts the center of oscillation to the right or left. Control adjustment provides a maximum of 1-1/2 in (38 mm) setting from actual center of the slide.

6 Speed Controls

☞ *If erratic motor operation occurs at minimum speed setting, slightly increase the speed setting.*

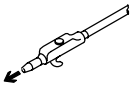
Speed To Left and Speed To Right controls set speed that welding gun travels from one end of the set travel width to the other. Control calibration is in percent and provides 16 to 130 ipm of adjustment.

SECTION 4 – MAINTENANCE

4-1. Routine Maintenance

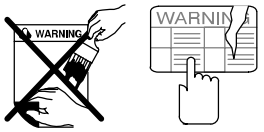
▲ **Disconnect power before maintaining.**

Every Month

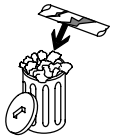


Blow Off Neoprene Seals On Slide.

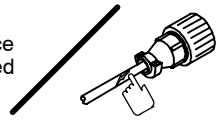
3 Months



Replace Unreadable Labels

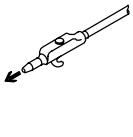


Replace Cracked Parts



Cords

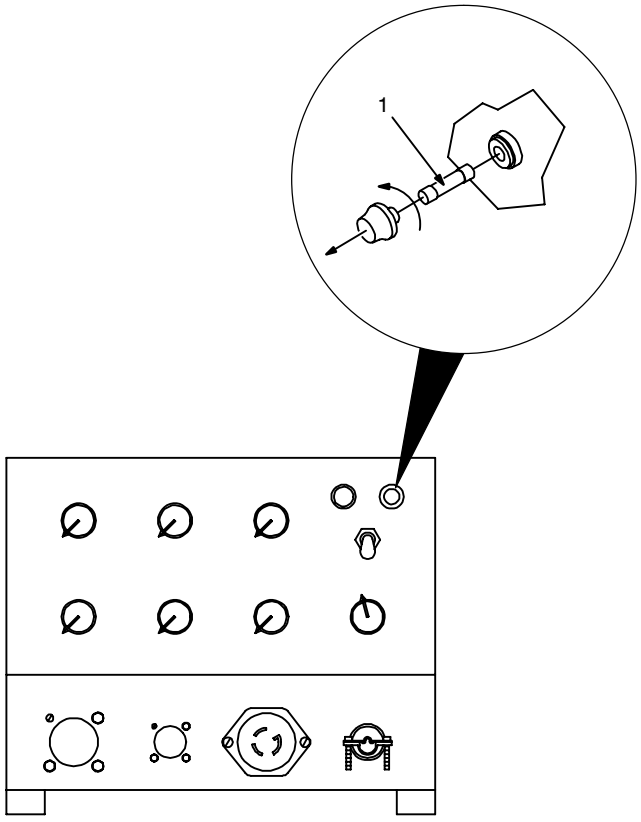
6 Months



OR

Blow Out Or Vacuum Unit. During Heavy Service, Clean Monthly.

4-2. Overload Protection



▲ **Turn Off and unplug unit.**

1 Fuse F1 (See Parts List For Rating)

Fuse F1 protects oscillator control from overload. If F1 opens, oscillator control shuts down, but pilot light remains on. Replace F1.

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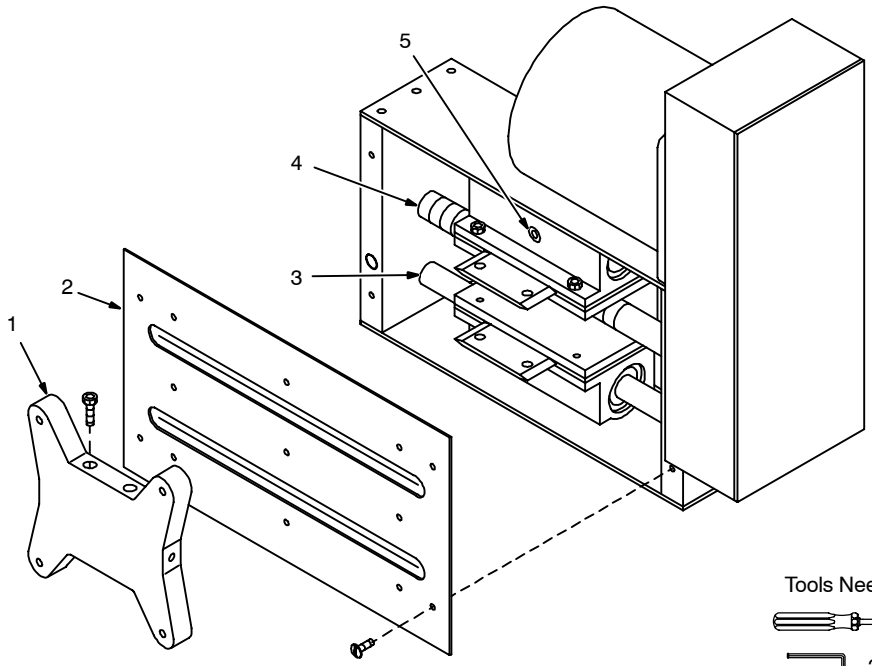
4-3. Slide Lubrication



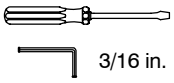
▲ **Turn Off and unplug unit.**

1 Gun Mounting Plate
2 Slide Cover With Seal
3 Shaft
4 Screw Lead
5 Pillow Block Oil Hole

Disassemble as shown. Wipe all surfaces clean. Lubricate pillow block with No. 20 oil. Lubricate screw lead with No. 90 oil.

Reinstall cover and plate.

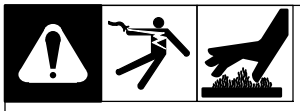
Tools Needed:

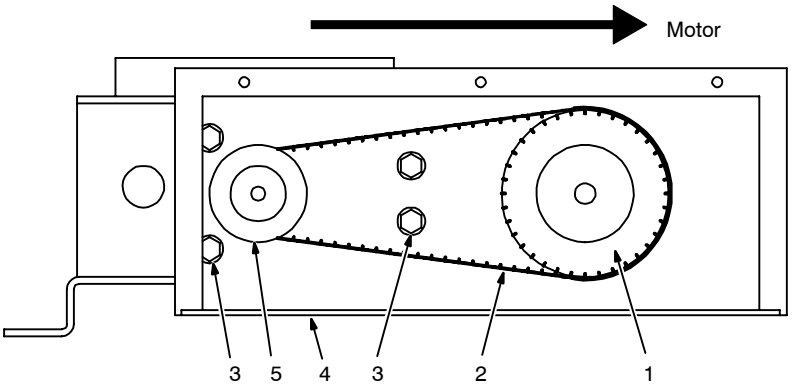


3/16 in.

ST-154 580

4-4. Drive Belt Adjustment





▲ **Turn Off and unplug unit.**

Remove screws securing cover over belt housing and remove cover. Clean pulleys. Adjust belt as follows:

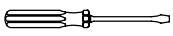
1 Motor Pulley
2 Toothed Drive Belt
3 Bolt
4 Belt Housing
5 Drive Pulley

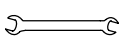
Loosen four bolts and slide belt housing towards motor to tighten belt. Do not overtighten belt.

Clean and inspect drive gear and potentiometer gear.

Tighten bolts. Install and secure cover over belt housing.

Tools Needed:

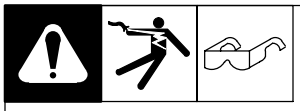


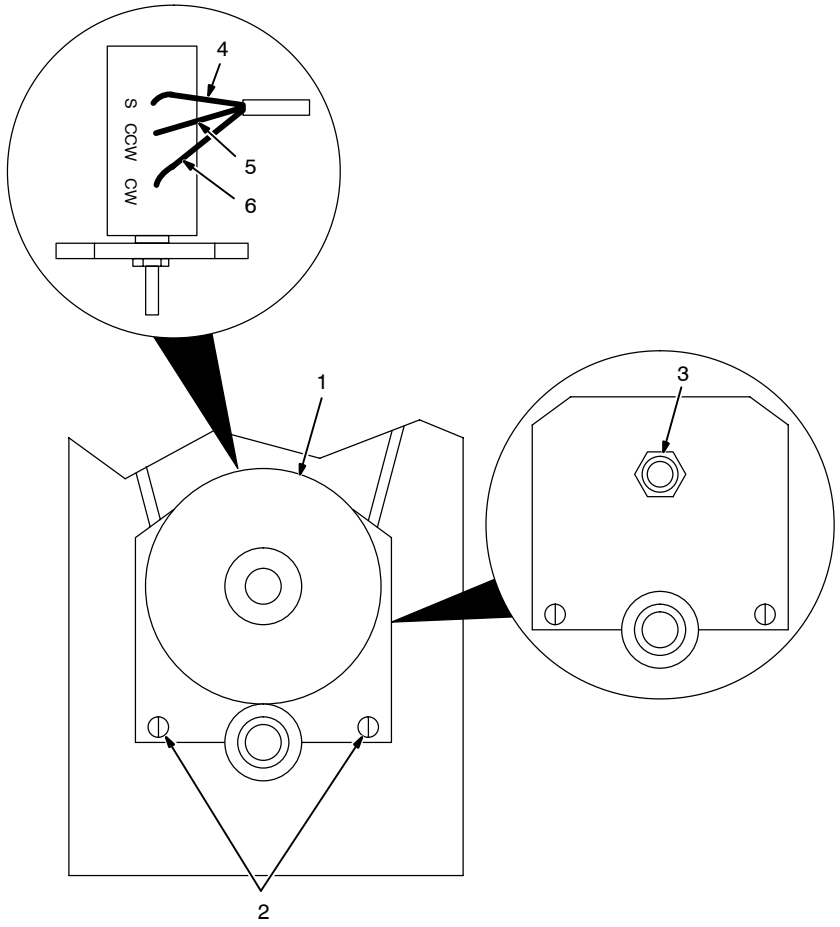


7/16 in

ST-154 579

4-5. Slide Potentiometer Replacement





1 Potentiometer Gear

Loosen setscrews, and remove gear from potentiometer shaft.

2 Mounting Plate Screws

Remove two screws securing potentiometer mounting plate.

3 Shaft Nut

Remove shaft nut securing potentiometer to mounting plate. Slide potentiometer out, and allow to hang free.

Install new potentiometer into mounting plate, and secure using nut from old potentiometer.

4 White Lead

5 Red Lead

6 Black Lead

▲ **Do not allow solder to fall into unit. Cover exposed areas when soldering and unsoldering. Remove cover and clean unit when done.**

Unsolder leads from old potentiometer, and discard potentiometer.

Solder leads to new potentiometer.

Reinstall gear onto potentiometer shaft. Hub of gear should be flush with end of shaft. Tighten setscrews.

Manually move gun mounting plate to the center of slide.

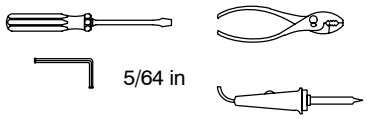
Turn gear on slide potentiometer to one extreme, and then back five turns.

Align gear on slide potentiometer with small gear on drive screw.

☞ *Maintain a small amount of backlash between gears.*

Use screws removed previously to secure potentiometer mounting plate.

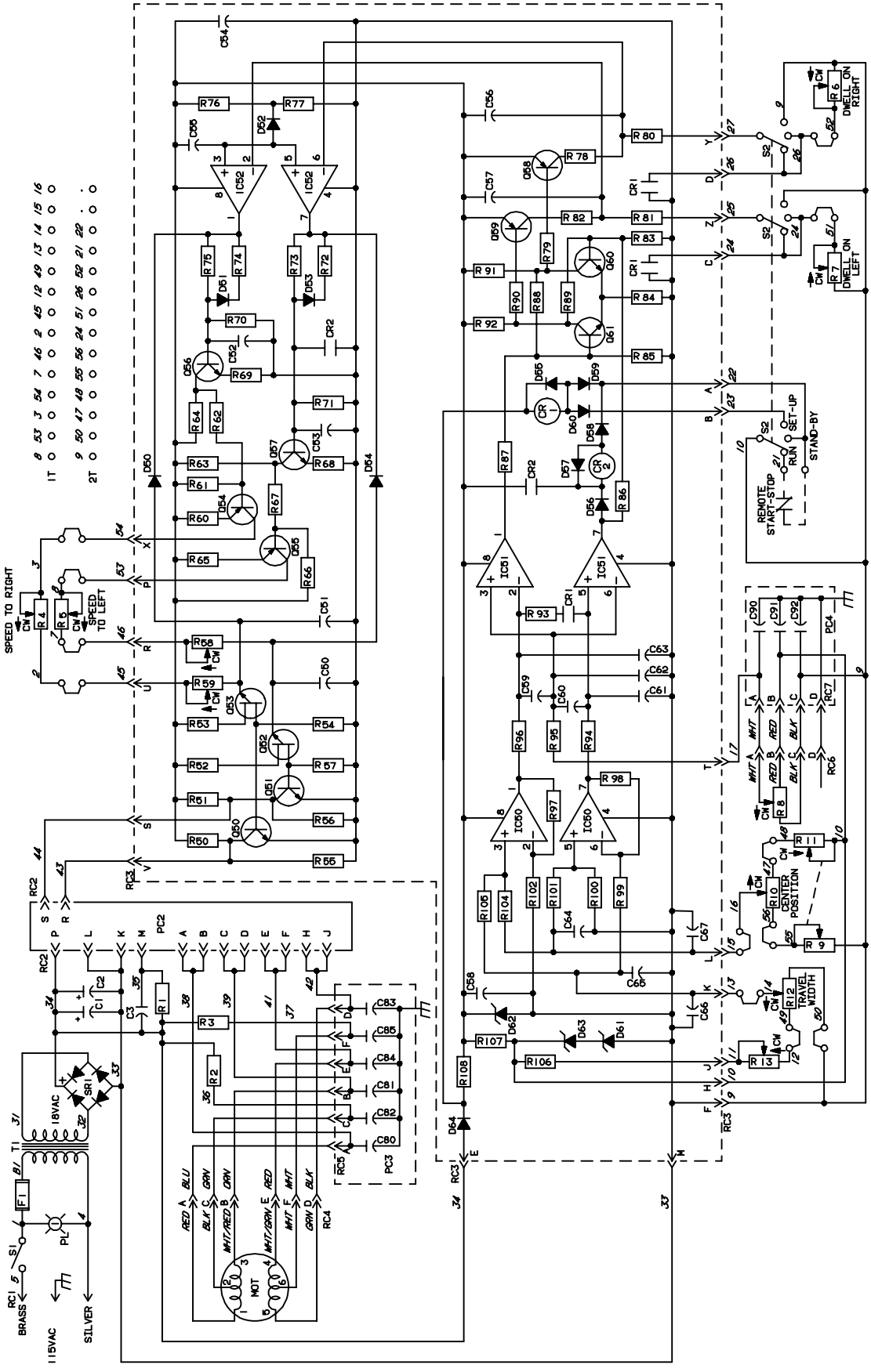
Tools Needed:



4-6. Troubleshooting

Trouble	Remedy
Unit completely inoperative.	Check and replace line fuse(s), if necessary, or reset circuit breaker.
Unit inoperative, but pilot light is on.	Check fuse F1 and replace if necessary (see Section 4-2).
Erratic operation.	Speed set at minimum. Slightly increase speed setting (see Section 3-1).
	Check and secure cord connections between oscillator control and slide (see Section 2-7).
Slide stalled and motor hums.	Check slide area and remove any obstructions. Turn power off and back on to restart.
	Excessive load on slide. Reduce load (see Section 2-2). Turn power off and back on to restart.

SECTION 5 – ELECTRICAL DIAGRAM



SC-099 133-B

Figure 5-1. Circuit Diagram

Notes

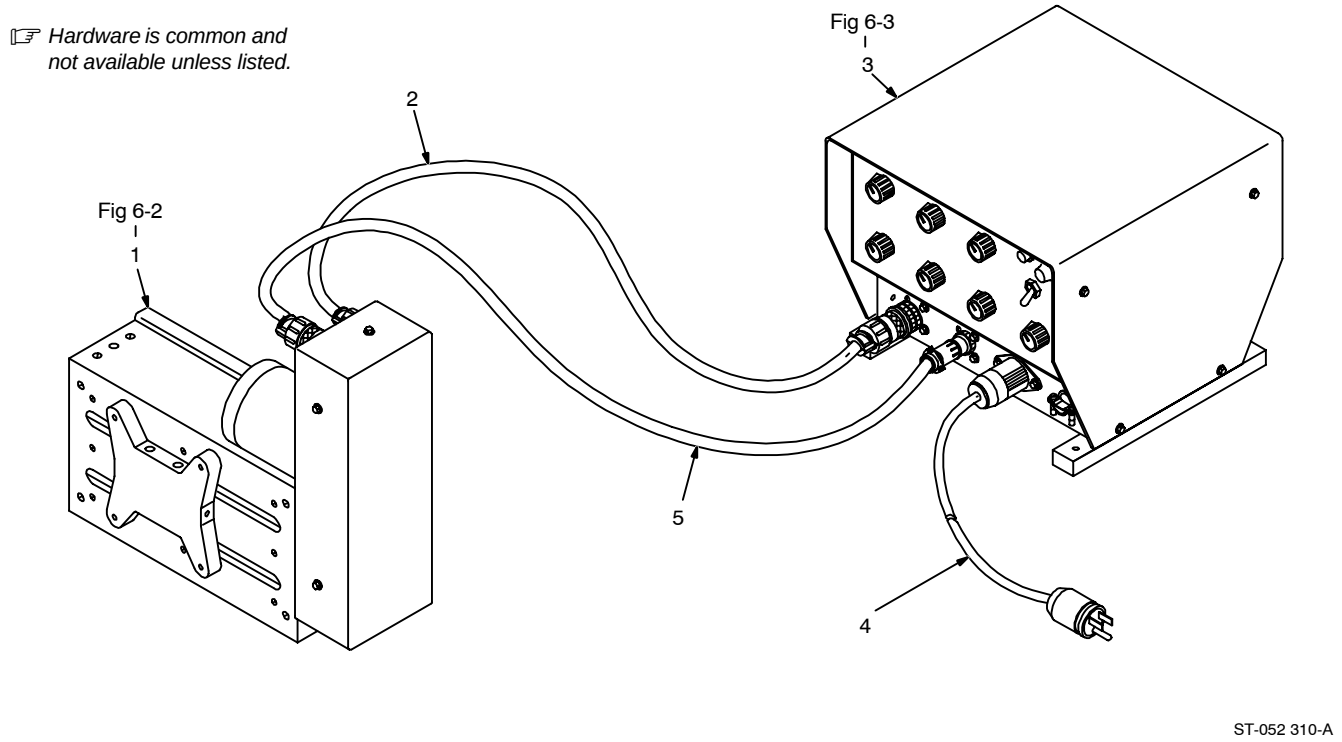


Figure 6-1. Main Assembly

Item No.	Part No.	Description	Quantity
		Figure 6-1. Main Assembly	
... 1	009 286	.. SLIDE, oscillator (Fig 6-2)	1
... 2	075 044	.. CABLE, interconnecting (consisting of)	1
	073 516	.... CONNECTOR, circ 11skt plug Amphenol MS-3106A-20-33S	1
	039 734	.... CONNECTOR, circ clamp str rlf sz 20-22S Amphenol AN-3057-12	2
	073 139	.... CABLE, port No. 16 6/c (order by ft)	10ft
	073 517	.... CONNECTOR, circ 11 pin plug Amphenol MS-3106A-20-33P	1
... 3	009 285	.. CONTROL BOX, (Fig 6-3)	1
... 4	052 723	.. CABLE, pwr (consisting of)	1
	056 442	.... CONNECTOR BODY, twlk grd 2P3W 15A 277V	1
	600 341	.... CABLE, port No. 16 3/c (order by ft)	10ft
	073 690	.... PLUG, str grd armd 2P3W 15A 125V	1
... 5	009 266	.. CABLE, control weld oscillator (consisting of)	1
	073 686	.... CONNECTOR, circ 4skt plug Amphenol MS-3106A-14S-2S	1
	039 828	.... CONNECTOR, circ clamp str rlf sz 14-14S Amphenol AN-3057-6	2
	601 469	.... CABLE, pwr shld 18ga 3/c (order by ft)	10ft
	053 075	.... CONNECTOR, circ 4 pin plug Amphenol MS-3106A-14S-2P	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

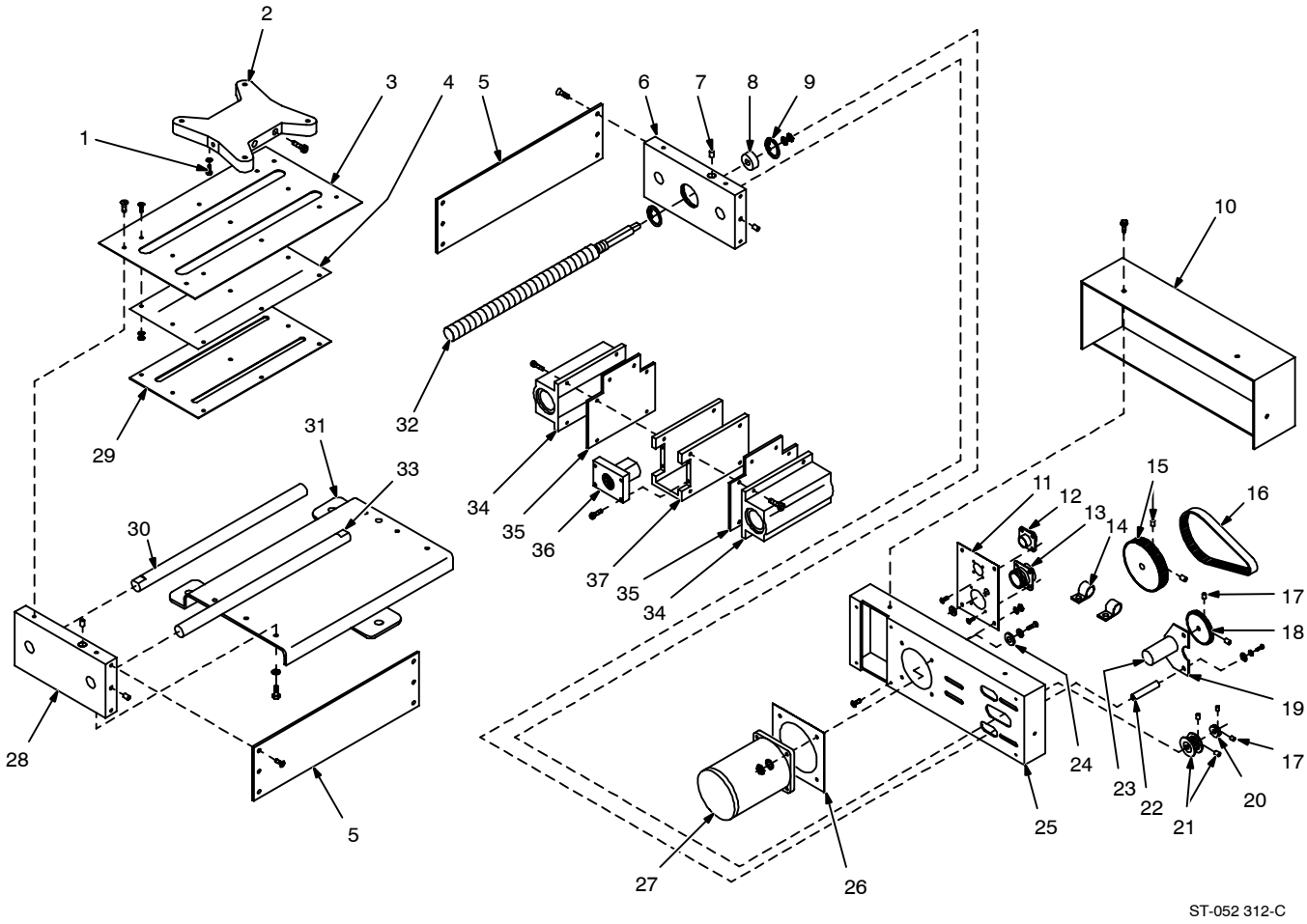


Figure 6-2. Slide, Oscillator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		009 286	**Figure 6-2. Slide, Oscillator (Fig 6-1 Item 1)**	
1		009 278	FOOT, closer seal	4
2		090 683	PLATE, mtg	1
3		009 259	COVER	1
4		009 250	SEAL, clamp retainer	1
5		009 255	BAR, side	2
6		053 452	END PLATE, RS drive	1
7		602 178	SCREW, set .250-20 x .375 knrlpt sch stl	8
8		053 428	BEARING, ball rdl sgl row .393 x 1.378 x .43	1
9		073 240	RING, retaining int 1.375dia x .050	2
10		009 262	COVER, drive	1
11		009 244	PANEL, mtg connectors rcpt	1
		010 116	GROMMET, rbr .375 ID x .500mtg hole .062 groove	1
12	RC6	076 624	CONNECTOR, circ 4 pin rcpt Amphenol MS-3102A-14S-2P	1
13	RC4	077 175	CONNECTOR, circ 11 pin rcpt Amphenol MS-3102A-20-33P	1
14		010 142	CLAMP, nyl .312 clamp dia	2
15		009 287	PULLEY, gearbelt	1
16		009 289	BELT, gear 17in lg	1
17		604 612	SCREW, set 8-32 x .125 cup pt sch stl	4
18		009 241	GEAR, potentiometer	1
19		009 239	BRACKET, mtg potentiometer	1
20		009 253	GEAR, ball screw	1
21		009 283	PULLEY, gearbelt	1
22		009 252	SPACER, mtg potentiometer	2
23	R8	009 237	POTENTIOMETER, WW sltd sft 10/T 1.5W 10K ohm	1
24		128 673	WASHER, shldr nyl .625 OD x .203 ID x .312dia	4
25		009 264	HOUSING, drive	1
26		009 243	INSULATOR, mtg motor	1
27	Mot	009 276	MOTOR, weld oscillator	1
28		053 451	END PLATE, LS drive	1
29		009 251	CLAMP, retainer seal	1
30		009 290	SHAFT, oscillator	1
31		009 257	PAN, base	1
32		053 429	SCREW, drive	1
		602 213	WASHER, lock stl split .375	1
		605 883	NUT, stl hex jam .375-24	1
33		009 240	SHAFT, oscillator	1
34		009 291	PILLOW BLOCK, .750 shaft twin ball bush	2
35		009 256	STRIP, support	2
36		097 494	MOUNTING FLANGE, ball nut	1
37		097 401	BLOCK, carriage	1
		601 469	CABLE, pwr shld 18ga 3/c (order by ft)	1ft

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

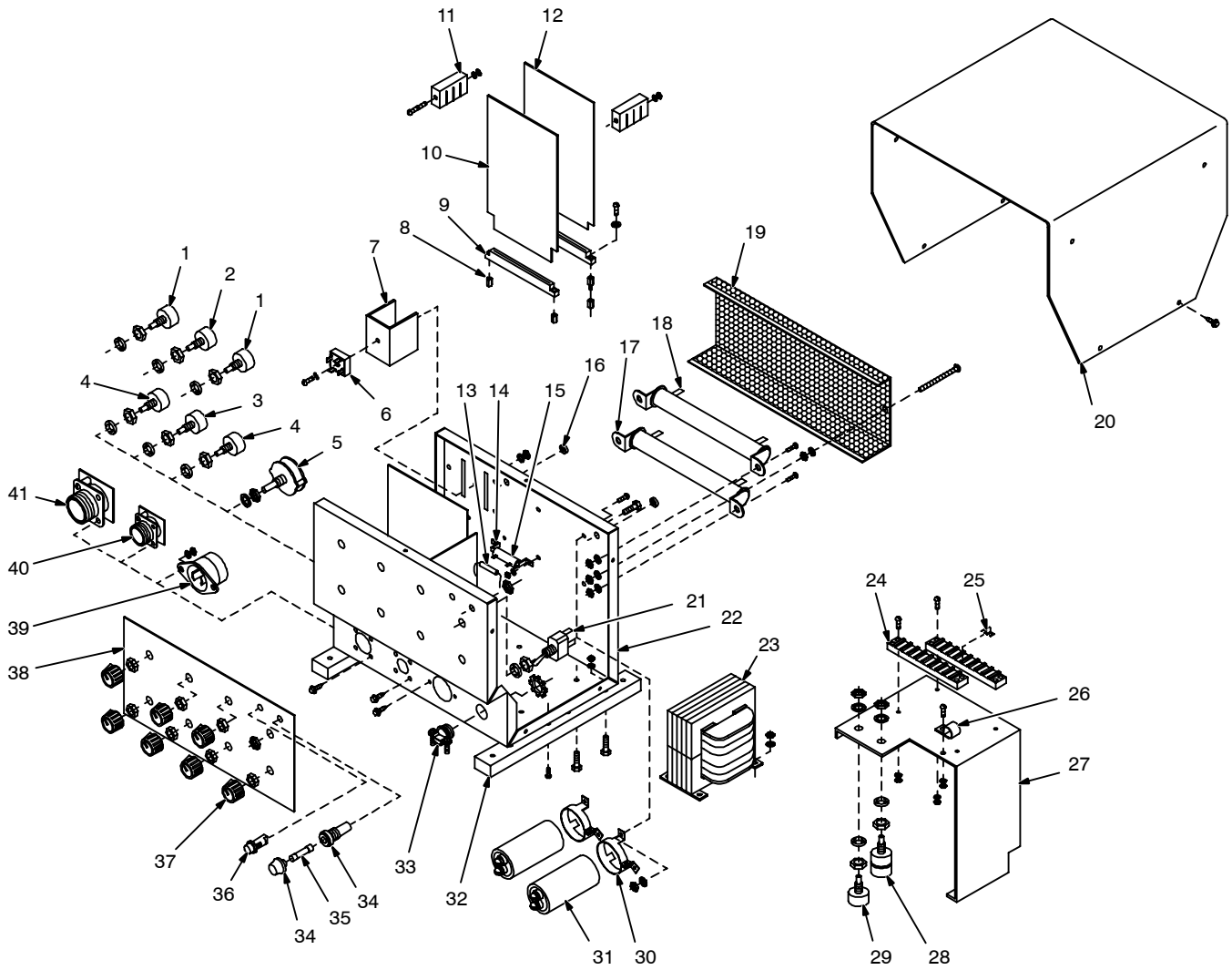


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Figure 6-3. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		009 285	**Figure 6-3. Control Box (Fig 6-1 Item 3)**	
1	R4,5	009 154	POTENTIOMETER, CP plain rnd 1/T 2W 100K ohm	2
2	R10	009 156	POTENTIOMETER, C sltd sft 1/T 2W 2.5K ohm	1
3	R12	035 897	POTENTIOMETER, C sltd sft 1/T 2W 1000 ohm	1
4	R6,7	005 577	POTENTIOMETER, C sltd sft 1/T 2W 200K ohm	2
5	S2	009 342	SWITCH, rotary 3posn	1
6	SR1	035 704	RECTIFIER, integ 40A 800V	1
7		009 254	HEAT SINK, rectifier	1
8		009 335	STAND-OFF, No. 4-40 x .625 lg	6
9	RC2,3	073 730	CONNECTOR, edge 22skt plug Cinch Jones 50-22A-20	2
10	PC1	009 340	CIRCUIT CARD, control logic	1
11		009 267	CLAMP, circuit card	2
12	PC2	009 339	CIRCUIT CARD, control motor	1
13	C3	073 453	CAPACITOR, elctlt 10uf 150VDC	1
14		605 741	CLIP, mtg resistor .312 ID core	2
15	R1	030 836	RESISTOR, WW adj 10W 1K ohm	1
16		604 311	GROMMET, rbr .250 ID x .375mtg hole .062 groove	2
17		091 709	CLIP, mtg resistor .500 ID core	4
18	R2,3	030 640	RESISTOR, WW adj 100W 5 ohm	2
19		009 248	SHIELD, resistor	1
20		+072 402	COVER, top control box	1
		134 327	LABEL, warning general precautionary	1
21	S1	011 233	SWITCH, tgl SPDT 15A 125VAC	1
22		072 400	CHASSIS, control box	1
23	T1	009 234	TRANSFORMER, kVA 1/3 115-19	1
24	1T, 2T	009 292	BLOCK, term 5A 14P	2
25		000 368	LINK, jumper term blk 5A	1
26		010 146	CLAMP, nyl .625 clamp dia	1
27		009 247	BRACKET, mtg components	1
28	R9,11	039 462	POTENTIOMETER	1
29	R13	000 479	POTENTIOMETER, C sltd sft 1/T 2W 25K ohm	1
30		006 426	CLAMP, capacitor 2.000dia	2
31	C1,2	009 344	CAPACITOR, elctlt 9000uf 35VDC	2
32		009 258	SKID, base	2
33		115 104	CONNECTOR, clamp cable .500	1
34		012 617	HOLDER, fuse mintr	1
35	F1	*012 663	FUSE, mintr gl slo-blo 3A	1
36	PL1	074 188	LIGHT, ind red lens	1
37		097 922	KNOB, pointer	7
38			NAMEPLATE, (order by model and serial number)	1
39	RC1	056 665	RECEPTACLE, twlk flg inl grd 2P3W 15A	1
40	RC7	073 687	CONNECTOR, circ 4skt rcpt Amphenol MS-3102A-14S-2S	1
		009 364	TUBING, brs .250 OD x .031 wall x .468	1
	PC4	124 771	CIRCUIT CARD, HF filter	1
41	RC5	073 515	CONNECTOR, circ 11skt rcpt Amphenol MS-3102A-20-33S	1
		009 363	TUBING, brs .250 OD x .031 wall x .281	1
	PC3	124 770	CIRCUIT CARD, HF filter	1

*Recommended Spare Parts.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

TRUE BLUE® WARRANTY

Effective January 1, 1997
(Equipment with a serial number preface of "KH" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Robots
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Orbital Weld Heads
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Miller®
The Power of Blue.

Owner's Record

Please complete and retain with your personal records.

Model Name	**Serial/Style Number**
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	**Zip**

Resources Available

Always provide Model Name and Serial/Style Number.

Contact your Distributor for: To locate distributor nearest you call 1-800-4-A-Miller	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Owner's Manuals Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks
Contact the Delivering Carrier for: For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	File a claim for loss or damage during shipment.

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